

COMPUTERWORLD

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Terminal User Can Call 2nd Computer

MAYNARD, Mass. — A new time sharing system announced here last week is designed so that the user at his Teletype terminal will be able to call in a larger computer to help the standard central computer when he feels it worthwhile.

The system, called the Time Share-8 and based on Digital Equipment's PDP-8/Is, already is operating as a normal time sharing system with a single central processor. As yet the use of the

back-up computer has not been implemented.

The system, designed as a low cost time sharing system for in-house or service center use, is aimed at the educational and industrial market and DEC estimates that it can provide multilingual services at between \$2 to \$3 per terminal hour.

Processor Can Be Terminal

The technique used to allow the use of back-up computers was

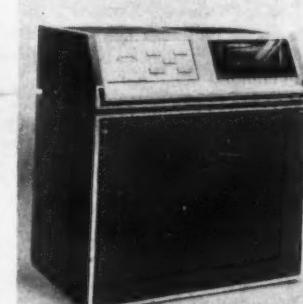
described to *Computerworld* by Norman Doelling, project manager for the Time Share-8. "It simply converts the central processor into a terminal itself," he said. "You might prepare the program on the smaller system, the Time Share-8, and test it out on some small problem. Then, when it was working properly, you could give it the real data, and tell it to send it over to a bigger system, like our PDP-10. This is done from the user's terminal. The Time Share-8 will prepare the program and the data for the larger system, will set up the necessary means to recover the answers when they arrive back, and complete the job for the user."

Programmers Part of Market

Doelling was careful to point out that this was only one of the advantages which DEC had built into the system. He particularly believed that its low price and ability to handle several languages will attract groups of programmers who are considering setting up their own businesses. "Time sharing utility sales are currently running at \$75 million annually," Doelling said, "and are increasing at a rate of about 50% a year."

The Time Share-8 offers individual companies, small groups of businessmen, or programmers an opportunity to offer time sharing services with a minimum investment.

Details of the Time Share-8 are given on page 7.



Pack-Scan 1 disk pack tester

rejection criteria of the appropriate IBM specification while providing more flexibility, so that a manufacturer can establish his own quality control.

The tester, designed for use by disk pack manufacturers, can test all the tracks on a 2311 compatible disk pack in about five minutes and does not involve the use of a computer.

The standards to which the disks are tested are controlled by three parameters which are set before the tests start. These standards are said by the manufacturer to adequately embrace the

AT&T Appeal Denied by FCC

WASHINGTON, D.C. — The final action in the Carterfone case came last week when the Federal Communications Commission rejected the American Telephone and Telegraph Co.'s request for reconsideration and reaffirmed its ruling that the foreign attachments tariff is unlawful. However, the tariff will remain in effect until it is replaced.

Apparently accepting the ruling, AT&T immediately formally filed a new tariff to take effect Nov. 1 which provides for the attachment of customer owned modulators and demodulators and other terminals through a \$2 a month telephone company protective device, but which still restricts the general interconnection of customer provided communication systems with the telephone network.

A tariff identical with one filed late in August with the FCC and its filing was "similarity," according to an AT&T spokesman. Equivalent

tariffs were filed with the various state agencies, also to become effective Nov. 1.

The FCC ruling provides that the old foreign attachments tariff will continue in force until Nov. 1, when the new tariff presumably will replace it.

The Carterfone case started in 1957. At first the FCC supported the telephone company argument that the tariff prohibited the use of the Carterfone. Then in 1965, Thomas Carter brought a private antitrust suit in the federal courts, which held that the FCC

must rule on the validity of the tariffs. The ruling that the foreign attachment tariff of the Bell System was, and had been since its inception, unlawful came in June.

Then AT&T sought, and won, a temporary stay from the FCC to keep the tariff in effect until the FCC had a chance to study AT&T's request that the FCC reconsider its decision. This appeal was rejected by the FCC last week, but AT&T had succeeded in keeping the tariff in effect until it had a chance to prepare and file a new one.

No Software Backup, System Crashes

SAN FRANCISCO — The recent breakdown of the Air West computerized information system — which snarled the operations of the new airline and upset many of its customers — stemmed from the failure of an apparently simple patch written

by Air West programmers. The results of the original failure were then magnified as a result of the lack of software or usable hardware backup, inaccurate forecasts as to when the system would start working, and a failure of person-to-person communica-



A sales clerk inserts a charge card into the new terminal, enabling the computer system to check the account before recording data on the new sale.

Real-Time Credit System Replaces Cash Registers

SANTA ANA, Calif. — Ricca Data Systems, Inc. is introducing a credit and inventory control system for department, variety, and other retail merchandise outlets which provides real-time control of customer credit, halts use of delinquent accounts, captures stolen or counterfeit charge or credit cards, and provides inventory control.

The on-line system can be installed either on a stand alone basis or as a supplement to existing data processing systems. It is compatible with present credit and inventory control procedures.

The system consists of a reader incorporated into a terminal installed at each sales counter plus a central information storage and retrieval system complete with all related software. The terminal provides all cash register functions as well as the credit and inventory control functions.

System design is modular and allows maximum flexibility in providing each retailer with his own custom designed system. Subsystems are available, such as for connecting the readers via telephone line to the customer's existing data processing center for credit verification.

The central processor is manufactured by Raytheon, but the special purpose hardware is basically being manufactured by Ricca.

The company told *Computerworld* (Continued on Page 15)

On the Inside

Is IBM Grooming a Successor to PL/1?

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Berna Conference to Open With Careers Day

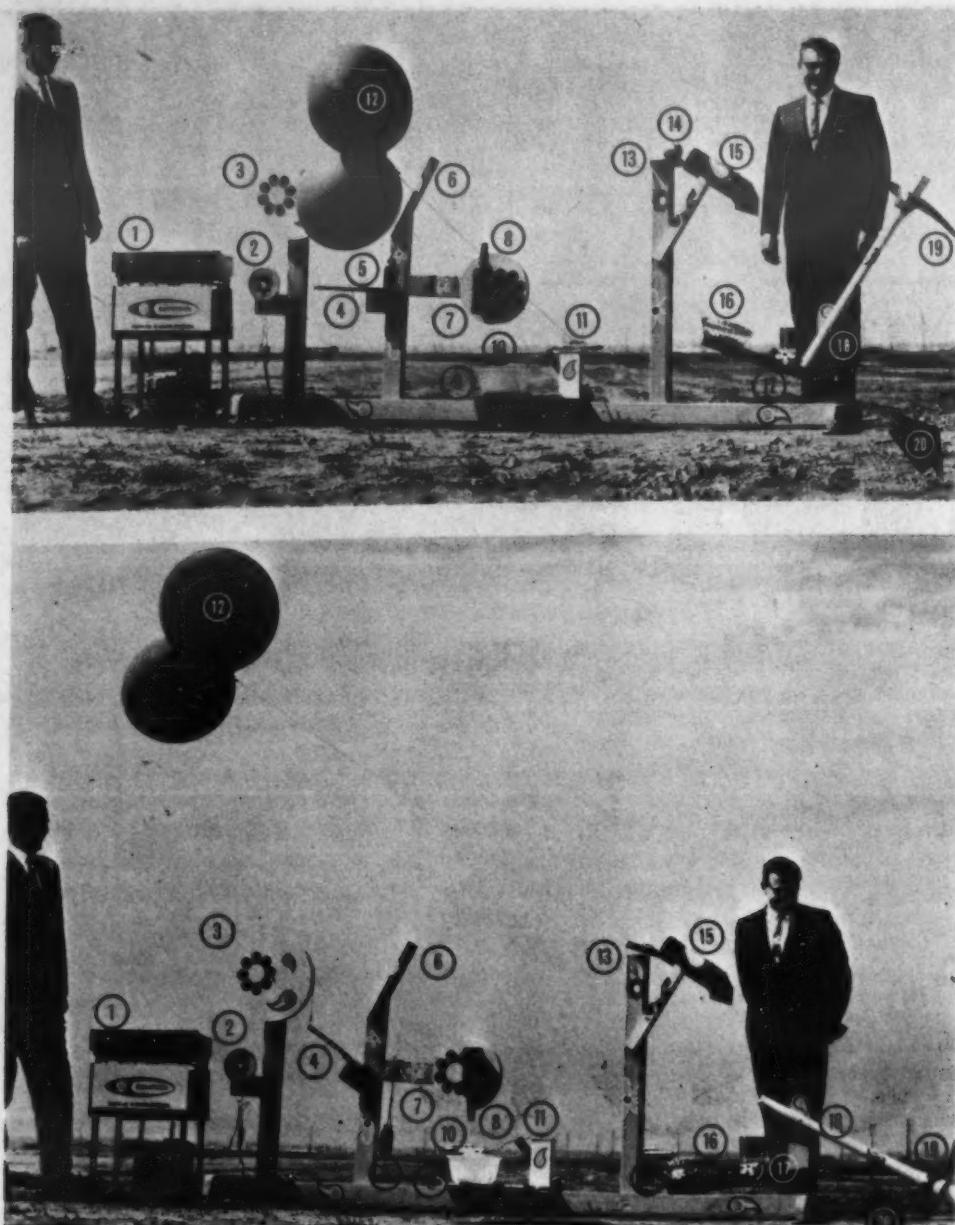
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tions within the company itself.

Public Version

Publicly, what happened was that after an advertising campaign about the integration of the new airlines routes (Air West was (Continued on Page 16)



Automated Groundbreaking

Computer to Ground Interface is the name of the device used to break ground for the new Datatron plant in Irvine, Calif. From left, Arthur L. Purcilly, the firm's president, actuates digital computer timer (1), setting in motion motorized pulley (2), winding cord over large pulley (3), lifting platform (4), dropping weight (5) through pulley (6), permitting cam mounted wheel (7) to turn bottle (8), pouring water into vessel (9). Float rises (10), actuating spring release anchor (11) for halyard of helium filled balloons (12), raising platform (13), causing

weighted ball (14) to drop through stove pipe trajectory guide (15) into receptacle (16), triggering end of pick handle (17) which moves at great force from fulcrum point (18) because of inherent weight of pick head (19) which falls on target area (20) where Ron Birtcher verifies groundbreaking. This scientific breakthrough was developed by Datatron's vice president in charge of manufacturing, William D. Mansfield, with great respect due Rube Goldberg among other renowned scientists.

Buy/Sell System Checks for Human Clerical Errors

NEW YORK — Externally Reynolds & Co.'s new computerized communications system for transmitting buy and sell orders looks like a simple communications network. But internally it is devoted not only to speed but to eliminating human clerical errors.

The system, called Tops (Teleregister omni processing and switching), was developed by Reynolds and Bunker-Ramo Corp.

Correction

In an article on the content of the new USASI Cobol standard last week on page 8 it was stated that the section on random access was in an appendix to the standard. Actually, the section on random access is part of the main standard. It is the section on random processing that has been placed in an appendix.

One of its unique features, according to Bunker-Ramo, is that it validates all order prices against the latest market quotations, which are maintained in a companion Teleregister system for stock quotations.

Altogether, as many as 100 accuracy checks are made, depending on the type of order, the company said.

National Network

Orders are entered on Teletypes and relayed from 51 branch offices and correspondents via 14 high speed control units throughout the country at 2400 words a minute. At the New York data processing center, the computers check for errors and instantaneously request any corrections from the sender. If free of errors, the order goes automatically to the proper exchange floor in a

total elapsed time of three seconds from originating office; executed orders are confirmed back over the Tops system with the same speed.

In addition to improving customer service through greater speed and accuracy, the new system also eases clerical problems — the physical processing of essential records and documents that has boomed with business volume. It performs many operations electronically, freeing people for other tasks.

Accuracy Checks

Accuracy checks cover a wide range of items, such as valid stock symbol and exchange, correct order number, correct account number format, conflicting or incomplete instructions, approximate price, and originating office. Tops price checks orders beyond

Computerized Data Inscriber Offered, Has Tape and Disk

LOS ANGELES — Another computer based system for keying data directly onto disk or tape has been announced, this one by a new firm, Computer Machinery Corp. (CMC).

The system, which can replace keypunches or single-unit data inscribers, can handle from six to 32 keystations. The cost per keystation ranges from \$13,600 for the minimum system to \$5000 for the maximum system. Optional software for verifying by control totals leases for \$400 a month.

Unlike the LC-720 system announced by Logic Corp. recently [CW, Aug. 28], which puts the records on tape or disk sequentially as they flow from the various keyboards, the KeyProcessor system assigns disk sections to each keystation, keeping the records separated. The records are then transferred to one or more tapes as desired.

The LC-720 can hold data in memory for simultaneous verification. The KeyProcessor has no provision for this because such immediate verification doesn't appear practical, James Sweeney, president of CMC, told *Computerworld*.

KeyProcessing Coined

Sweeney has coined the word "KeyProcessing" to describe the use of the unit. He said it is less expensive than keypunching or the new single-unit data inscribers in most installations because "it records data on a single reel of magnetic tape rather than on thousands of cards or dozens of tapes; and because it applies computer logic to input data."

The computer logic makes it possible to key data in any convenient form without regard to the final format required for input to the main computer system.

KeyProcessing produces magnetic tape output for use as input to any data processing system. One system can have up to 32 individual keystations, all independently entering or verifying

data simultaneously, on 32 different jobs.

Software Supplied

Keystations are controlled by a new computer containing proprietary programs provided by CMC as part of the system. As data is entered through each keystation, it is processed by computer and stored on a magnetic disk in a location unique to the keystation of original entry.

After data has been recorded, it may be verified either by rekeying it and comparing it within the computer or, without rekeying, by balancing control totals to totals derived from the original keying.

Verified data is transferred, batch by batch, from the disk onto one reel of magnetic tape. This reel is taken to the data processing system for high speed input, while the keying operation goes on uninterrupted.

Four Subsystems

The CMC KeyProcessor System is composed of four principal hardware subsystems: (1) input — typewriter-like keyboards, a display, and operator console housed in a simple work table; (2) control — a new high speed, digital computer functioning basically as a multiplexer for data input/output under stored program control; (3) storage — a magnetic disk unit (compatible with the IBM 2311) which holds 7.25 million characters of data (sections are assigned to input keyboards and all data is held on disk through completion and prior to transfer to output); and (4) output — a magnetic tape device which writes data in a format allowing the tape to be used as input to a separate general purpose computer system.

Sweeney said that optional devices such as display screens, cathode ray tubes, alternate type keyboards, communication modems, and automatic card punching devices will be available on a scheduled release basis following initial system deliveries.

CMC, a privately held company, was incorporated in July, 1968. Sweeney and a number of his associates come from Scientific Data Systems.

Sweeney said the new company had been formed for the specific purpose of introducing the KeyProcessing system.

John L. Moser is vice president-engineering.

C, as in Confusion

WALTHAM, Mass. — Cybertronics, Inc., a manufacturer of magnetic tape cleaning and certifying systems, has changed its name to Kybe Corp.

Company officials explained that the change was made because of confusion between the company's name and that of Cybertronics, Inc., a New York based computer leasing firm.

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Editorials**A Double Welcome**

\$1000 doesn't buy much these days, yet to see it being given away is remarkable — particularly by students who, in our experience, are still not all that flush. But the founding chapter of the new computer sciences honor society, UPE, in a gesture of good will to permit a national leadership group for UPE to be funded independently, has established a \$1000 bank account for the expenses of a yet-to-be-organized national organization. This, they hope, will make it practical for potential UPE chapters which are just forming to play a significant role in determining UPE policies — even before they are financially self-supporting.

Computerworld is pleased that a computer sciences fraternity has been organized and is doubly pleased with the moral character of the charter chapter, as evidenced by that very real \$1000.

Welcome UPE, and welcome the Texas A&M UPE chapter.

What Shall We Call Them?

New phenomena in the field are the computer service organizations which are splitting off from some of the largest companies in the country. Pillsbury, with Call-A-Computer, was one of the first. The operation is certainly one of the most exciting of its kind.

But others are coming fast. Last week Lever Brothers, of soap fame, entered. Next week, who knows?

These entries pose many problems for the future, for it cannot reasonably be expected that the entry of such industrial giants will leave the industry unaffected. And they pose one immediate problem for the present. What on earth do we call them? Large-scale computer services? Industrial based computer services? Or simply computer service organizations?

We don't have a name for them — have you?

**COMPUTERWORLD**

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CW Trend Analysis**Is IBM Grooming New APL As the Successor to PL/I?**

Quietly but firmly, IBM appears to have presented the successor to PL/I. At its large display booth in the exhibit area at the ACM National Conference in Las Vegas last month, IBM concentrated on presenting APL (A Programming Language), based upon the notation introduced by Dr. Kenneth Iverson in 1962.

IBM built the display with a half-dozen terminals connected by telephone line to one of its computers in Los Angeles. It staffed each terminal with an experienced APL user, and provided closed circuit television so that an audience could watch the interaction on each-terminal between the user and the computer. Members of the audience were invited to step up to any available terminal and try APL for themselves. In addition IBM offered a class in APL for any who wished to attend.

Coupled with the recent withdrawal of the key PL/I manual [CW, Sept. 4] and the relatively decreasing flow of publicity on PL/I from IBM, the statements IBM makes about APL take on added significance. IBM's position and reported experience in brief appear to be:

APL More Concise

1. APL is more concise than PL/I and is as easy or easier to learn than PL/I. Partly this is achieved by IBM's implementation which is more forgiving than is its implementation of PL/I. In part it is achieved by the basic conciseness of the language alone. A thin manual serves to cover APL, but it takes a thick one for PL/I.

2. APL is strong in three major areas: mathematical computation, logical operation, and text manipulation. Matrix operations are particularly convenient and are one of the most powerful aspects of the language. A full range of logical operations is provided with string manipulating capability at least equal to that available in PL/I. In text manipulation, APL can be used for composing articles, speeches, and the like with easily used format and editing capabilities.

3. IBM personnel who had used APL report greater satisfaction with it than do IBM users of PL/I. Some of this satisfaction appears attributable to the convenience of the implementation and some to the nature of the language itself.

4. IBM reports that the availability of APL has caused its personnel to utilize computers more widely and more effectively than has the availability

This is one of a series of articles on industry trends written for *Computerworld* by various experts. We asked these people to tell it like it is — and some told us that they couldn't really speak out unless we withheld their names. We reluctantly agreed, with the provision that they would not use this anonymity as a license to make rash and unfounded statements. Ed.

of any other language or computer resource. Again this in part may be attributable to the implementation, but in part goes back to the language itself.

IBM Uses It

5. Internally, IBM appears to be increasing APL use more than PL/I use. Further, it has used APL for documenting the logical design of the IBM System/360 and it has through one of its subsidiaries SRA (Science Research Associates) begun the publication of introductory and advanced materials on APL.

6. APL notation provides a complete documentation for a program algorithm in a more concise manner than does a flow diagram or USASI flow chart. APL is defined in a form which replaced conventional flow charts, but not the other parts of program documentation.

7. Two major disadvantages of the APL demonstrated are its use of a larger set of symbols than defined in the USASCII, and the lack of explicit provision for list operations. The latter defect could be remedied without much trouble but the former strikes at the heart of the language itself, but not at its implementation on any computer with an 8 bit byte and supported by augmented keyboards.

In summary, the evidence available can be read to indicate that IBM is preparing to offer APL as the successor to PL/I. The timing and the extent of the effort put into APL will reflect in part public response to APL and to the competing languages. The nature of their use will probably cause Cobol to continue as a viable and supported language, but PL/I, Algol, and to a lesser extent Fortran users will convert to APL for new programs. The status of the list processing languages will depend upon whether or not modifications are made to APL to accommodate list operations more directly.

Letters to the Editor**PL/I Defended**

To the Editor:

As a computer professional, CDP, member of ACM, PL/I user, and member of Guide (that "other" user group), I feel obligated to comment on your issue of Sept. 4, 1968.

It would appear that your publication suffers either from a lack of reliable information sources or ulterior motivation. The latter seems quite unlikely since your editor-in-chief is a member of ACM, and presumably ACM's ethics would (should) be *Computerworld's*.

1. 26 column inches on a routine manual change in the PL/I language specifications seems a bit much.

2. The new manual (Y33-6003) does not appear difficult for the user to get since I received a copy from IBM without even asking for it.

3. Within my circle of PL/I user friends and acquaintances there was relief that the language specification manual was finally reclassified to take it out of the hands of the casual programmer who may try to write a program using features not yet present in

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the current implementations, (e.g., list process features under the OS version were not supported until release 15/16). One of the major complaints prior to the new programmer manual was knowing what was implemented and what was not yet available without digging in a separate manual.

4. Although I have not used the DOS version, the pointers and based variables appear to be language compatible. There is a warning in the appendix of the D-level manual that based variables are not implemented (pre-release 15/16) in the F-level compiler.

These differences in the timing of the implementation of language features certainly are not dialects like the Fortran differences (PRINT vs. WRITE), but represent different subsets of the PL/I language. Both implementations appear to be valid subsets as

defined in the new language specifications manual.

5. Although there has been considerable criticism of PL/I in the trade press, the dissatisfaction appears to be based largely on the flexibility of the language (too complicated, too many options) or the inefficiencies of code generation in earlier implementations. The criticism also appears to come from non-PL/I users rather than people really familiar with the language. Personally, after years of fighting Fortran and Cobol inflexibilities or making stupid coding errors in FAP, Autocoder and Assembler, PL/I has been a refreshing experience.

This installation has eliminated all Cobol, most of the Fortran, and will replace much of the system programming now in assembler with PL/I now that pointers are available. All application programming is in PL/I.

Don P. Moehrke, CDP
Senior Systems Analyst
Cutler-Hammer
Milwaukee

So you got the "restricted" manual without asking. Now, did anyone not get the "restricted" manual? Ed.

(Continued on Page 5)

Letters to the Editor

(Continued from Page 4)

Bigelow Challenged

To the Editor:

The thesis by Robert P. Bigelow [CW, Sept. 4] is unacceptable. With his lead statement (?) "But do computer people really care about social problems?" Mr. Bigelow is "begging the question." As an attorney he should know better.

In an attempt to qualify his remarks concerning both ACM and DPMA, Mr. Bigelow uses statements taken out of context which can only be misleading to the uninformed. Whether or not improvements can be made in the wording of either of the DPMA ethics codes is not germane. What is important is that neither ACM guidelines nor DPMA codes propose that the associations or members cast moral judgment on society, computer users, etc.

The DPMA code of ethics refers to ideals "as outlined in its International Bylaws." Responsibilities listed are to promote understanding of data processing methods and procedures, cooperate with members in dissemination of knowledge pertaining to the general development of data processing, to protect the employer's interests, and to uphold the member's nation and honor the chosen way of life. Obligations are to management, to fellow members, to the employer, and to the country.

The Certificate in Data Processing is awarded by (and may be revoked by) the DPMA Certificate Advisory Council. Standards of education, experience, competence, and personal integrity, as established by the council, must be met before the certificate is awarded. . . . A CDP holder has an obligation to the public at large and to his profession, and to serve the interests of his employer and clients (loyally, diligently, and honestly). The CDP holder's obligation to the public includes the promotion of understanding of data processing methods and procedures. To members of his profession the CDP holder should "encourage the dissemination of knowledge. . . .," and he is admonished to avoid discrediting the data profession in any way.

As DPMA is an association of members of a similar calling (i.e., "professionals") whose primary function is service, not lobbying, Mr. Bigelow's universal indictment of computer "professional" organizations for failure to submit "statements" to various congressional committees is unsupported.

The computer professional, as any citizen, should be concerned with politics, poverty, and people. However, as a computer professional he is concerned with data processing technology and management and, if an executive, is concerned with the application of management techniques which provide a fair return on stockholder investment.

Mr. Bigelow doesn't speak for me!

Robert R. Cromer, CDP
Detroit Chapter, DPMA

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R.E. Montijo

Record Club Orders 9300 From Univac

The Record Club of America, York, Pa., has ordered a Univac 9300 system to update records of members, mailing list selections, inventory control, and sales analysis. The complete system will include four magnetic tape units and a high speed printer.

Norris Oakley Richardson & Glover, London, has ordered an NCR Century 100 computer which will use two NCR 735

Orders and Installations

magnetic tape encoders for input. The system will maintain portfolios for internal accounting and management reports. Delivery is scheduled for July, 1969.

Computer Retrieval Systems, Inc., Washington, D.C., has ordered a Univac 9300 system to be installed early next year. The system, which will include high speed magnetic tape and disk file units, will be used to produce legal references.

Goldblatt Bros., Inc., a Chicago retail home furnishings firm, has installed an IBM 360/30 to record store and warehouse transactions and match goods in stock against customer orders from the company's 31 retail stores.

The Netherlands Newspaper Union, a publisher, has purchased a 1700 computer system from Control Data Corp. for its Rotterdam facilities. The system will be used to service two photo typesetting units. Precorrected copy will be stored on magnetic disks and printed out by flexowriters for visual correction. The data on magnetic disks will be used to create paper tape which will be used to operate the photo composition units.

The Indiana Life Insurance Co., Indianapolis, Ind., has purchased a Univac 9300 system for updating the records of policyholders on a daily basis. Scheduled for delivery next May, the system will include five magnetic tape units.

Park, Davis & Co. has leased an EMR 6130 system to be installed in October at the company's research laboratories at Ann Arbor, Mich. The unit will provide real-time access to the computer from individual laboratories for monitoring experiments on an around the clock basis. The laboratories to be served will include those specializing in new drugs.

Utah State University in Logan has ordered a Univac 9200 system for use by students in the engineering department. Complex mathematical problems, translated into Fortran, will be processed by the system. Delivery is scheduled for early this fall.

General Electric Co.'s heavy military electronics department has installed a \$2.5 million third generation GE-635 at Syracuse, N.Y., to be used as a data communications network from Vermont to Florida. Completion of the network is expected by 1970. Initially, the new computer is being used for scientific and engineering applications and will eventually handle a variety of business applications.

CONTRACTS

of a centralized personnel management system. The computerized system is expected to be operational by December, 1969.

PRC Gets Navy Project

LOS ANGELES — The Navy Electronics Laboratory Center, San Diego, has awarded Planning Research Corp. a \$369,000 contract for computer program design and implementation for the Master Control Subsystem of the Integrated Flagship Data System.

Computer Leasing Contracts

GARDEN CITY, N.Y. — Northrop Corp. has leased from

Granite Equipment Leasing Corp. and installed four IBM 360 systems — Models 20, 30, 40, and 65 — in its EDP processing center at Hawthorne, Calif.

Hospital System

ATLANTA — NCR has awarded a contract to General Software, Inc. for the programming of a facet of NCR's hospital information system.

Cancer Survey

WASHINGTON, D.C. — To aid in processing information from its third national survey of cancer in the U.S., the National Cancer Institute has awarded a contract to Computer Usage Development Corp. for the development and documentation of a pilot EDP system.

Market Entry: Photo Scanner

BURLINGTON, Mass. — Optronics International, Inc., a new company in the computer applications field, is currently marketing its first product, a scanner for conversion of photographic information to computer input data.

The company's activities concentrate on the electro-optical market, with emphasis on hardware for science and industry. Optical data acquisition and three dimensional display systems are among products presently in the design phase, the company said.

Louisiana Group Starts Consulting Company

BATON ROUGE, La. — A group of data processors and businessmen has established a new firm, Systems Applications Consultants, Inc. Its services are extended to southern Louisiana

data processing installations on projects concerning systems design, programming, and implementation, with accent on initial design for new installations and systems conversions.

Texas Firm Appoints Five As Representatives

HOUSTON — Applied Peripheral Systems, Inc., a manufacturer of specialized data communications terminals, has appointed five firms as the company's representatives.

They are ALJO Sales, Inc., 305 Shell Building, Tulsa, Okla.; Dickerson Engineering Sales Co., 905 Harbor City Blvd., Eau Gallie, Fla.; ITM Associates, Sudbury, Mass.; Morse Associates, 3840 Birchwood Rd., Falls Church, Va.; and T.J. Shiell Associates, 1205 Middle Ave., Menlo Park, Calif.

Texas Instruments Gets U.S. Traffic Control Project

DALLAS — The U.S. Bureau of Public Roads has awarded a \$109,000 study contract to Texas Instruments, Inc. for a 14 month research program to develop sensors for advanced traffic control systems. The study will include presence, velocity, and classification of vehicles for the computerized control of traffic signals.

Contract Extensions

EL PASO, Texas — NASA has awarded two contract extensions, totaling \$1.5 million, to Computing and Software for the Goddard Space Flight Center and Langley Research Center. The Goddard contract calls for continuation of on-site data systems planning, computing services, and operation of the IBM 360/91 and 360/95 and Univac 1108 systems at the center, as well as maintenance of specialized telemetry processing systems for space oriented programs. The Langley contract calls for operation of the Control Data 6600 and 6400 computers and central recording and data transcription equipment for aerospace research and vehicle simulation programs.

Sao Paulo Highway Work

LOS ANGELES — The Frederick R. Harris Engineering Corp., New York, has selected Planning Research Corp. to provide consulting services for work to the Sao Paulo State Highway Department, Brazil. The study project is jointly funded by the department and the Agency for International Development. Primary interest will be highway maintenance activities and improvement of standards, equipment, administration, and budget programs.

Remote Data Terminals

TARZANA, Calif. — American

Details of Time Share-8 System Given

MAYNARD, Mass. — The Time Share-8 computers [see page 1] are based on PDP-8/I systems with modifications to make them suitable for time sharing operations. In general this has been

done by providing for the "trapping" of unsuitable instructions (such as Halts, and input/output instructions) so that they can be handled by the operating system and by providing for the protection of both user and executive program areas.

Software available for the systems includes Fortran and Focal, a conversational language developed by DEC. Basic is scheduled for later implementation on the system.

Time Share-8 computers have 8000 or 16,000 words of core memory and a 250,000 word, 17 msec. average access memory disk. Four thousand words of core memory are devoted to executive software, with the remaining 4000 or 12,000 available to users. The storage system provides several levels of file protection and permission. The disk memory is available to all users for storing binary or source language files. All peripheral input

and output devices, such as tape transports and line printers, can be assigned to individual users under operator control. This permits hardware resource sharing,

Calculation of Time Share-8 Terminal Costs

In the story on page 1, Norman Doelling of Digital Equipment is quoted as estimating the terminal hour cost of the new Digital Time Share-8 systems "as between \$2 and \$3 an hour."

The basis of his calculations is given below:

Assumed System: 16K word Time Share-8 with 16 terminals	\$65,000
Assumed write-off period	4 years
Capital cost per year	\$16,000
Capital cost per terminal per year	\$1000
Assumed terminal usage per year	1000 hours
Capital cost per terminal-hour	\$1
Overhead percentage	between 100% and 200%
Total cost (excluding line charges) per terminal hour	\$2-\$3



The Digital Equipment Corp. uses this composite photograph to symbolize multiple uses of its new Time Share-8 system, which can handle from 8 to 32 terminals simultaneously. DEC claims that the system can cut the cost of time sharing, which often runs from \$10 to \$20 per terminal hour, down to \$2 to \$3 per terminal hour.

Low Cost Computer Has 4K Memory

A new general purpose digital computer, priced at \$4900, is designed for use in custom data processing and control systems, in R & D laboratories, and in universities. A 4096 word memory expandable to 8192 words is

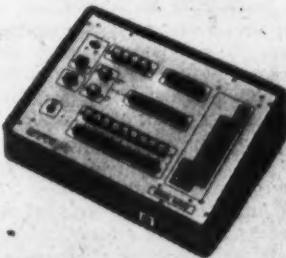
a stored program. Dept. PR, Educational Products, Fabri-Tek Inc., 5901 S. County Rd. 18, Minneapolis, Minn. 55436.

Card Readers



included in the basic SPC-8. The 8 bit computer has a 2.2 microsecond cycle, six 12 bit registers, two accumulators, and priority interrupt, and understands 46 commands. Delivery is within 120 days of order. General Automation, Inc., 706 W. Katella, Orange, Calif. 92667.

Control Keyboard



A new control keyboard console has been introduced for use with the Bi-Tran Six computer system. The unit allows an instructor to operate the computer from his desk and from any position in the classroom and to face the class while operating the system. Registers in the computer can be loaded octally from the keyboard. Control keys permit mathematical operations without

Display Panels

A line of plug-in alphanumeric display panels for display applications ranging from small consoles to large wall systems has been announced by Ferranti-Packard Electric Ltd. Interfacing to keyboards, tape readers, computers or via communication circuits is straightforward, with the units accepting serial or ASCII inputs directly. Typical applications are arrival/departure displays for railroad or air terminals. Caroe Marketing, Inc., P.O. Box 305, Briarcliff Manor, N.Y.

New Products

Forms Splicer



A new splicer uses a perforated sticky tape to join left over forms stacks. The splice will not interfere with the operation of forms handling equipment. Multiple part forms may be spliced without causing jams in the printer by splicing each ply one form ahead.

or behind, the first copy. Guide pins are provided for exact alignment. The Columbus Forms Splicer uses readily available sticky tape and may be adjusted for any width form. Periphery, Inc., 65 Nicholas Rd., Framingham, Mass. 01701.

Reader-Sorter

A document reader-sorter for banks reads magnetic ink encoded documents and sorts them into 11 different pockets (10 accept and one reject). Called the Type 232 MICR, the device can be operated as an off-line sorter or on-line to any Honeywell Series 200 computer. The unit will be available in January 1969 and will lease for \$1150 to \$1250 per month or sell from \$56,250. Honeywell Electronic Data Processing Division, 60 Walnut St., Wellesley Hills, Mass. 02181.



Plug-in alphanumeric display panel

as well as time sharing.

An accounting package permits operators to charge for central processor and/or terminal hours used.

Data-Pak to Move to Larger Quarters

WATERBURY, Conn. — Data-Pak, Inc. will move to larger quarters at 269 Brookside Rd. William R. Chandler, president, said the new location will provide space for a new computer center as well as executive offices. Future plans call for additional centers throughout the country.

Strategic Systems to Open Washington, D.C. Office

NEW YORK — A new complex at 4933 Auburn St., Washington, D.C., will be opened this month by Strategic Systems, Inc., to

provide management consulting, software, education, and data processing services. Clement DeSimone has been named director and his associate will be Robert J. Gilbert. James H. Burton will be senior consultant and Fred J. Hubbard has been named operations manager.

Computer Applications Opens New Division

NEW YORK — Computer Applications, Inc. has formed a new corporate level systems engi-

neering division to service the federal government and its agencies. Walter Landauer has been appointed to head the new group.

Preferred Tabulating Moves to New Quarters

NEW YORK — Preferred Tabulating Service, Inc. has moved to 41 E. 28th St. Seymour Linett, president, said future plans in computer software will entail commercial applications for time sharing systems, hospital systems, and other commercial areas. Stephen J. Cohen, executive vice president, will head the new programming systems department.

Systems Capital Corp. Expands in Europe

PHILADELPHIA — Systems Capital Corp. has signed a joint financing agreement with Locafine, S.A. for the purpose of financing leasing arrangements in France. Leasing arrangements also have been completed with a company in Denmark and other French firms.

Informatics Opens Chicago Office

SHERMAN OAKS, Calif. — Informatics, Inc. has opened an office in Chicago to market and service the Mark IV File Management System. The new office at 120 S. Riverside Plaza, Gateway Center, will be headed by Stan Felderman, according to Gordon Utt, national marketing manager.

EDP Corp. Plans Move To Larger Quarters

KING OF PRUSSIA, Pa. — EDP Corp. plans a \$500,000 expansion program to begin in October involving the transfer of operations to its own building on Route 202, Allendale. At the same time, Marshall Neisen, Jr., president, announced the acquisition by his firm of Computer Programming Institute of Delaware. Robert R. Mitchell will continue as managing director of the school.



After calling a portion of an aeronautical chart from storage, an IBM researcher can update the chart with a light pen, then tell the computer to update the data on the file.

New Computer Graphics System May Speed Updating of Charts

WHEATON, Md. — The U.S. Coast and Geodetic Survey may soon be able to automate. Its manual chart drawing methods are strained by the increasing demand for updated aeronautical charts.

Computer assisted chart making, using CRT terminals and light pens, is now considered technically feasible as a result of a technique developed by IBM's Washington Scientific and Industry Development Center here in cooperation with the federal agency.

"The technique permits direct graphic communication between a cartographer and a computer," said F.E. McClung, chief of the agency's Aeronautical Charting and Cartography Research Group.

"This could solve a serious problem that has blocked our attempts at automation in the past — how to let a cartographer use his unique talents and judgment without interrupting the computer process."

The manual system is now strained by a critical shortage of cartographers, hundreds of chart changes daily, a requirement to update most charts every 7 to 28 days, and the demands of constantly increasing air traffic.

Hopefully the new technique will enable the development of a computer based method for producing charts in one fast, continuous process — from collection and assembly of raw data to automatically plotted master charts ready for volume reproduction.

Currently, the only way to insure chart legibility is for a cartographer to work with a draftsman at a drawing board. This manual operation often takes days. The cartographer-draftsman team arranges and rearranges chart elements on master overlays to make required changes and to resolve any resulting graphic "clutter." Updated, redesigned overlays are then sent to a printer for reproduction of the multi-colored charts.

Using the new technique, the same job can be performed in a fraction of the time directly from the screen of an IBM 2250 graphic display unit. With the touch of a light pen, a cartographer can alter the size or position of the symbols, lines, blocks of text, and other elements of charts assembled by a computer and displayed on the screen. If a change calls for a radio beacon symbol to be moved from one area

of a chart to another, the cartographer moves the symbol across the screen with the light pen. Blocks of text can be enlarged or reduced, lines of type can be split and rearranged, and lines can be erased or drawn in.

Once necessary changes have been made to the cartographer's satisfaction, he pushes a button on the terminal keyboard to transfer the changes to the computer's files. With the chart updated, the computer operates a plotter to create new color-separated master charts which are then sent to a printer.

"While the graphic technique promises considerable time saving in one major step of the traditional chart making process, the true significance of the development is that it has the potential to apply the speed, power, and accuracy of a computer to many other steps of a manual system," said McClung.

The new technique was developed on an IBM 360/50.

As NC Tape Punched

Engineers Preview New Parts

KALAMAZOO, Mich. — One picture is worth a thousand words — and dollars — at the Clarge Fan Co. here.

The picture in this case is a scale drawing of precision parts to be produced on a numerically controlled machine tool. As the company's computer creates the drawing for visual inspection by engineers, it also produces a punch tape that will direct the machine tool in making the part.

Clarge, a manufacturer of mechanical draft, air handling, and air conditioning systems, implemented the technique to increase the accuracy of its parts design and to reduce costs.

The drawings are produced by an IBM 1627 plotter hooked to an IBM 1130 computer.

Engineers utilize the drawings to verify their specifications and machine tool operators use them to confirm that they're making the correct parts.

The computer controlled parts design

Computer Keeps Track Of the World of Dogs

PHILADELPHIA — Want to know about color blindness in dogs? Left or right pawedness? Dog's dreams? Just call Dog Data Inc. here and ask its computer.

A dog lover can call (215) GE 8-3311 and have his question answered free. If the answer to his question is not one of 10,000 already on file, Dog Data will find the answer and add it to the file.

According to William G. Effros, founder and president of Dog Data, the toughest question came from a young student in Massachusetts who already had stumped his teacher with "How do they know that dogs are color blind?" Dog Data researchers found that dogs had been proved color blind both by studying their structure and by conducting experiments in color discrimination. That answer is now on file.

Most of the questions deal with grooming, breeding, training, and health. Dog Data has a list of all of the questions and uses the computer as a convenient way to store and print the answers.

For two kinds of questions, however, the computer does more than just print out an answer from a list. Effros estimates that 40% of the people who call ask where they can buy a particular breed of dog. To find the kennel nearest the caller, Dog Data uses a program that selects kennels by ZIP Code.

Choosing a Breed

The computer also helps people to pick a dog. Dog Data has developed a program called "The Dog For You" which suggests the best breed based on a questionnaire filled out by the prospective dog owner. Unlike Dog Data's other services, there is a \$5 charge for this.

At first, Dog Data had secretaries answer the calls. They were supposed to get the answers from the computer, but, explained Effros, "People who know something about dogs tend to give an answer themselves, and sometimes they are wrong."

Now, Dog Data has a 24 hour answering service which takes the questions. It is possible to send in a question, but most people call. According to Effros, "Dog lovers don't mind paying for a long distance call." But he also notes that many of the calls come in late at night when the phone rates are lower.

Kennels Foot the Bill

Dog Data's service is paid for primarily by kennels, which pay to be listed. If someone asks for a nearby kennel selling a Chihuahua, and there is a sponsoring kennel within 50 miles, the questioner gets that listing. If there is no sponsoring kennel in the area, then Dog Data gives the name of a nearby kennel even though it has not paid to be listed. An individual who wants to sell a dog can be included on the list for one month for \$5.

Other support comes from manufacturers who buy advertisements on the ends of letters sent to questioners. Effros said that Dog Data selected the "best" brands of such products as dog foods, and only these are allowed to advertise. Even if a manufacturer does not advertise, Dog Data still will mention his product by name in answer to a specific question.

Dog Data, in business for two years, answers about 300 questions a week with the aid of an IBM 360/40.

Real-Time Video-Digital Converter Is Developed

GAITHERSBURG, Md. — Television pictures, live from a reconnaissance satellite, can now be seen immediately and stored in a computer for study at the same time.

This is made possible by the first video-to-digital converter that operates in real-time — so fast there is virtually no delay between receiving and converting the data. It does in one minute what it takes other converters 10 hours to do, IBM says.

The converter was developed to be carried aboard satellites by IBM's Federal

Systems Division. It changes TV pictures from analog to digital form so they can be more securely transmitted to earth.

The converter operates in real-time by using a parallel conversion technique — all the bits are determined at the same time — and current mode switching in the comparator circuits.

Analog voltage signals are generated by the light and dark areas of the TV picture. The signals are converted, transmitted to earth, stored in a computer, and reconverted to analog form for viewing.

Conversion to digital form for transmission is desirable because digital signals can be coded into patterns easily recognized on the ground. The digitized TV pictures are less susceptible to electrical or atmospheric interference.

Technical Details

The unit converts analog data in parallel to six bit resolution. It consists of a comparator, which compares the analog input voltage to reference voltages; an encoder made up of high frequency ferrite cores; tunnel diode detectors, which determine the current in the ferrite cores and produce voltage outputs; and pulse amplifiers, which amplify the diode pulses to levels compatible with computer logic.

The input analog voltage is sampled by clocking the comparator current source with a digital sample pulse. The analog voltage determines current flow. The sample pulse controls the current. The ferrite transformer couples the current to trigger the diode circuit.

The diode is biased for monostable operation and will produce a pulse whenever the current falls from greater than half magnitude to zero. Falling current corresponds to an increase of the sample pulse. A digital one or zero is produced, depending on which way current flows.

EDP Schools Now Adding Campuses

Private EDP schools, which sprang up in answer to the demand for EDP personnel and usually were operated in store fronts and office buildings, are more and more slipping into the traditional school image.

Hard on the heels of an announcement by

Control Data Institute that it would open a school on the campus of St. Louis University this fall [CW, Aug. 28], two schools have announced that they are setting up schools with campuses of their own.

Computer Age Industries, Inc., of Fairfax

Va., has purchased an 8.3 acre estate in Fairfax and is remodeling the colonial mansion as a school to be called Computer Age Institute - Fairfax Campus. It will have five classrooms, a computer installation, administrative offices, and the corporate offices of Computer Age Industries.

"We welcome comparison" with other schools, said Swen A. Larsen, chairman of the firm, "as our clear goal is to build a reputation as the quality computer training institution in the Washington metropolitan area."

The other school that will have a campus is the Control Data Institute of Burlington, Mass. The institute is building a 30,000 square foot school in the North West Industrial Park, six times the size of the existing institute at Waltham, Mass. It will have 12 classrooms, two laboratories, a computer installation, a student lounge and library, and parking for 250 cars.

SDC Opens Programming Course to Public

SANTA MONICA, Calif. - A six month training program in computer programming open to the general public will be inaugurated by System Development Corporation (SDC) it was announced today by W.W. Parsons, SDC vice president, administration.

"During the last 10 years more than 2100 new employees have been trained as computer programmers in SDC's in-house educational facilities," said Parsons. "The

experience gained in this program . . . now will be made available to all qualified applicants seeking a career in the field of programming."

The class will start Oct. 28 and will be given during the evening hours at SDC's headquarters here. Students having two years of college and who pass an aptitude examination will receive 12 hours of instruction each week.

Tuition for the course is \$1000.



EDP Educational Service Offered In Movie Form

COSTA MESA, Calif. - A new EDP educational service, for beginners right up to DP managers, is being offered by Edutronics, a new firm here.

The service, called Animated Computer Education (ACE), consists of animated sound films. The company supplies the film, viewing equipment, workbooks, textbooks, and test materials, to be used where and when convenient for the student.

Edutronics says that the ACE method is perhaps the only medium by which consistent computer education can be disseminated on the massive scale required today. It cites these advantages: course material available where and when it is wanted, there are no scheduling problems or minimum class requirements, and there is no need to provide classrooms or auditoriums.

The firm plans to offer courses for all standardized EDP staff jobs in systems analysis, programming, and operations.

RCA Realigns Its Education Operations

NEW YORK - All of RCA's educationally oriented operations, including RCA Institutes, Inc., and the Instructional Systems Division, are now headed by a new vice president for education systems who reports directly to RCA President Robert W. Sarnoff.

Anthony L. Conrad, formerly president of the RCA Service Co., has been appointed to the new post.

Dr. Carroll V. Newson, vice president, education, will continue as RCA's principal corporate officer in the company's relationships with professional educators and educational organizations, Sarnoff said.

The Instructional Systems Division, Palo Alto, Calif., designs computer assisted instructional systems.

Other operations put under Conrad include:

- The education activities of the Instructional and Professional Electronic Systems Department which formerly were in the Commercial Electronic Systems Division. The department manufactures language laboratories, 16 mm projectors for classrooms, and closed circuit TV equipment.

- Random House, Inc., a wholly owned subsidiary of RCA.

Seminar Scheduled On Computer Selection

PITTSBURGH, Pa. - "Computer Selection and Evaluation," will be held by the ACM Professional Development Committee at the Pick-Roosevelt Hotel here Oct. 24-25.

This state of the art survey will describe and evaluate quantitative and qualitative methods for selecting computers. It is aimed at managers and senior technical personnel.

The seminar has been prepared for ACM by Metametrics Corp., Washington, D.C. Instructors for the seminar are King B. Nelson and Enrico Merendini, both of Metametrics.

Fees, including study materials, luncheon, and refreshments, will be \$75 for ACM members, \$100 for nonmember employees of ACM corporate members, and \$125 for other nonmembers. Further information may be obtained from J.M. Adams, Jr., ACM, 211 E. 43rd St., New York, N.Y. 10017.

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Bema Conference Schedules Special Careers Program

CHICAGO — A Careers Day program will open this year's Bema conference and show here Oct. 28. It will star one of the business world's most "aware" people, Robert W. Galvin, chairman of Motorola and winner of last year's student chosen Moderator Magazine Award for his "honest answers" and for "listening to the young."

Shelton Fisher, president of McGraw-Hill, Inc., will start the day's program with a luncheon speech on "Why College Graduates Choose a Business Career."

Following the luncheon for college guidance and placement counselors, faculty advisors, and special guests, there will be a seminar for college juniors, seniors, and graduate students.

Galvin, who will describe "The New Look in Modern Business," is noted for his extensive efforts to improve understanding between students and business and is an authority on campus attitudes toward business. For the past two years, he has conducted "no punches pulled" dialogues with many student leaders in campus newspapers, over college radio stations, and in personal visits with numerous student bodies. His open-letter exchanges appeared in 50 campus news-



S. Fisher



W. Finke



E. Broene



R. Galvin

Careers Day Speakers

papers with a total circulation in excess of a half-million.

Walter W. Finke, president of Dictaphone Corp., will address the seminar on "The Dynamism of the Business Equipment Industry."

At both the luncheon and the seminar, Eugene M. Broene, chairman of the Bema Advisory Committee and vice president of Steelcase, Inc., will describe the exposition of business equip-

Engineers Set Discussion On Impact of Computers

PHILADELPHIA — The impact of computers on engineering management will be the theme of this year's Joint Engineering Management Conference here Sept. 30-Oct. 1.

Lt. Gen. Austin W. Betts, director of research for the Army, will be the luncheon speaker Sept. 30.

The conference will consist of four sessions, the morning sessions beginning at 9:15 a.m. and the afternoon sessions at 2:15 p.m. Scheduled for Sept. 30 are "Computer Aided Engineering Design" and "Communications and Technology Transfer." The Oct. 1 sessions will be "New Management Decision Techniques" and "Horizons in Computer Utilization."

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calendar

Oct. 3-4, Buffalo, N.Y. — ACM Sigplan PL/1 Forum. Contact: R.F. Rosin, Computer Science Dept., State University of New York, 4250 Ridge Lea Rd., Amherst, N.Y. 14226.

Oct. 6-10, Montreal, Canada — 10th Annual EDP Conference and Retail Research Institute. Contact: Ethel Langtry, National Retail Merchants Assn., 100 W. 31st St., New York, N.Y. 10001.

Oct. 15-16, New York, N.Y. — Computer Seminar on Information Retrieval. Contact: Earl Pick, HB&C, 188 W. Randolph Tower, Chicago, Ill. 60601.

Oct. 20-23, St. Louis, Mo. — 1968 International EDP Conference. Contact: SPA, 24587 Bagley Rd., Cleveland, Ohio 44138.

Oct. 21-25, Washington, D.C. — T-25 Real-Time Systems Design. Contact: Information & Systems Institute, Inc., 14 Concord Lane, Cambridge, Mass. 02138.

Oct. 24-25, Detroit, Mich. — Adapsco 24th Management Conference. Contact: Jerome L. Dreyer, Association of Data Processing Service Organizations, 420 Lexington Ave., New York, N.Y. 10017.

Oct. 23-Nov. 1, Chicago, Ill. — Bema 10th Annual Business Equipment Exposition, Management Conference, and Management Cinema. Contact: Business Equipment Manufacturers Association, 23 E. 42nd St., New York, N.Y. 10017.

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Codasyl Revamped, Revised Goals Set

ATLANTA — Codasyl (Conference on Data Systems Languages), having successfully helped to shepherd a standard Cobol through the wilderness to approval, has reorganized to face the challenge of keeping up to date. Specifically, it has increased the frequency of its meetings to about six a year from the previous two or three, brought some of the active workers onto the executive committee where they will have more influence, and now is looking to increase the role of the Cobol user (as opposed to the implementor) in its continuing efforts to promote commonality and compatibility among computers.

John Jones, who continues as chairman of the executive committee, pointed out that surveys have shown that Cobol is used by two-thirds of the installations in the U.S. which have business applications and also is widely used abroad.

Codasyl is an informal and voluntary organization of interested individuals, supported by their institutions, who contribute their efforts and expenses toward designing and developing techniques and languages to assist in systems analysis, design, and implementation.

Committees Appointed

In addition to the executive committee, standing committees were established with executive committee members as chairmen, as follows:

Planning Committee (Warren G. Simmons, U.S. Steel) to gather, assimilate, and disseminate information from implementors and users.

Programming Language Committee (Richard C. Kurz, NCR) to make possible compatible, uniform, source programs and object results with continued reduction in the number of changes necessary for conversion or interchange of source programs and data. The committee will concentrate its efforts in the area of tools, techniques, and ideas aimed at the programmer.

Systems Committee (T. William Olle, RCA) to build up an expertise in, and to develop, advanced languages and techniques for data processing, with the aim of automating as much as possible of the processes currently thought of as systems analysis, design, and implementation.

Jones announced that future Cobol specifications, as they are developed and extended by Codasyl, will be published as the *Journal of Cobol Development* to distinguish its role from that of the USASI Cobol Standard.

Conference Is Scheduled On Software Protection

Goetz when he recently obtained a software patent.

Two Surveys

Two survey papers will be given, one by Herbert Koller on "Industry Attitudes Toward Protection of Computer Programs," and the other by Prof. Irving Kayton on "Recent Case Law Decisions on the Patentability of Programmable Processes."

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Sunasco Merger Quadrupled In Worth Before Approval

PHILADELPHIA — In the five months between the announcement of terms and recent stockholder approval, the value of the merger of Sunasco, Inc. and Mauchly Associates, Inc. more

than quadrupled from the original \$14.7 million estimate to \$62 million.

The transaction involved the exchange of 2,275,000 shares of Sunasco common stock, 1.7 Sun-

asco shares for each Mauchly share held.

At the Sunasco stockholders' meeting — postponed from August to September — approval was given to change Sunasco's name to Scientific Resources Corp. Currently a finance and real estate firm, the company is making an effort to move into the computer field.

Sunasco also has completed its acquisition of International Data Products Inc., a Cleveland based computer leasing company, for 83,950 Sunasco common shares.

The company has been in the throes of reorganization since it sold its financially troubled Sun-set International Petroleum Corp. subsidiary to Commonwealth United.

Following the Sunasco stockholders' meeting, the directors declared a dividend of 41.25 cents on the \$1.65 preferred stock, payable Oct. 1 to stockholders of record Sept. 27. However, no dividend on the preferred stock has been paid for the previous five quarters and the directors took no action on the arrears.

Sunasco recently announced a loss of \$819,138 (36 cents a share) for the nine month period ended June 30 [CW, Sept. 11], while Mauchly reported a loss of \$224,354 for the year ended April 30.

Lawsuit Filed

A stockholder suit was filed in U.S. District Court here Sept. 12 challenging Sunasco's sale of 1.4 million shares of Commonwealth United common stock to Kleiner, Bell & Co., a Beverly Hills, Calif., stock brokerage firm.

The suit charged that Sunasco was obligated to tender its Commonwealth stock holdings to its preferred stockholders on the basis of a promise in proxy material soliciting their votes for the sale of Sunset Petroleum. The suit charged a conspiracy "to misappropriate and waste the assets of Sunasco for the personal enrichment of the defendants."

Sunasco President Thomas T. Fleming said "there is nothing material" in the suit, and noted that the sale to Kleiner-Bell had been completed.

Institutions Provide Half of Exchange's Volume, Official Says

CHICAGO — About half of the New York Stock Exchange's daily volume comes from institutional investors, Gustave L. Levy, chairman of the exchange's governing board, said in a speech here.

The estimate was an increase over the results of an October, 1966, survey — the most recent published figures — that showed that institutional investors accounted for about one third of the daily volume. Financial institutions have been heavy contributors to the unprecedented share volume, Levy said.

An exchange aid in New York added that big block trades of 10,000 shares or more — 3642 in 1966 and 6685 in 1967 — accounted for 4944 transactions in the first half of this year.



Honeywell Says 2nd Half Income Under 1st Half's

MINNEAPOLIS, Minn. — Honeywell Chairman James H. Binger says that second half earnings will be higher than last year's second half but less than this year's first half earnings.

He declined to say exactly how much the company expected to make, commenting only that current brokerage house predictions "aren't far enough off the mark for us to say they're too high or too low."

Security analysts are estimating 1968 earnings at \$3.10 to \$3.20 per share. Earnings in 1967 were \$42.3 million (\$2.85 per share) on revenues of \$1.05 billion.

First half earnings were \$19.6 million (\$1.32 per share) on revenues of \$594.5 million.

Binger said that the outlook for the company's computer business is "very good."

"We've introduced a number of new products in computer related fields which will add substantially to our position in the industry," he said, adding that the firm has found good acceptance for its Keytapes which put data directly on magnetic computer tape, bypassing punched cards.

Binger noted that industrial products "are languishing a bit now, and the immediate prospects aren't good," but predicted growth in the field during the next three years. This is the only area of operations that is not currently contributing to the higher results, he said.

Merrill Lynch, Others Receive Extension From SEC to Answer Violation Charges

WASHINGTON, D.C. — Merrill Lynch, Pierce, Fenner & Smith — the nation's largest brokerage house — has been given a 10 day extension to answer Securities and Exchange Commission charges that the firm violated federal securities laws [CW, Sept. 11].

At least four other firms involved in the SEC charges that Merrill Lynch gave inside information about declining Douglas Aircraft earnings to 14 institu-

tional investors who were then able to sell or sell short the stock also were given extensions to Sept. 23.

Many of the 15 firms involved had asked for 30 day extensions.

The Madison Fund, the first to answer the SEC charges, said that it sold 6000 Douglas shares after obtaining information about the declining earnings, but did not say that it had obtained the information from Merrill Lynch and denied any wrongdoing.

New Registrations

COMPUTER AGE INDUSTRIES, INC., 10604 Warwick Ave., Fairfax, Va., a computer training school operator, filed to register 240,000 common shares. Proceeds, at \$1 per share, to be used for debt repayment, equipment, and other corporate purposes. No underwriter.

COMPUTER RETRIEVAL SYSTEMS, INC., 4905 Delray Ave., Bethesda, Md., a computer service company, filed to register 100,000 common shares and 100,000 common purchase warrants, to be offered in units of one share and one warrant. Proceeds, at \$6 per unit, to be used for expansion and other corporate purposes. The underwriter is Charles Plohn & Co., 200 Park Ave., New York.

DATA ARCHITECTS, INC., 393 Totten Pond Rd., Waltham, Mass., a computer service company, filed to register 125,000 common shares. Proceeds, at a maximum of \$20, to be used for expansion and working capital. The underwriter is D.H. Blair Securities Corp., 66 Beaver St., New York.

EDUCATIONAL COMPUTER SYSTEMS, INC., Suite 402, Financial Center, 3443 N. Central Ave., Phoenix, a developer of test scoring machines for use in educational and related fields, filed to register 150,000 common shares. Proceeds, at \$1 per share, to be used for equipment, working capital, and other corporate purposes. The underwriter has not yet been named.

PRINCETON TIME SHARING SERVICES, INC., Alexander Rd., Princeton, N.J., a company offering computer time sharing services, filed to register 150,000 common shares and 75,000 common purchase warrants, to be offered in units of one share and half a warrant. Proceeds, at \$6 per unit, to be used for working capital. The underwriter is Mayflower Securities Co., Inc., 32 Broadway, New York.

ROWAN COMPUTER & EQUIPMENT LEASING CORP., 610 Sunrise Hwy., Baldwin, N.Y., a lessor of computers and related equipment, filed to register 308,000 shares with warrants attached to purchase an additional 308,000 shares, to be offered in units of one share and one warrant. Proceeds, at \$6 per unit, to be used for equipment and working capital. The underwriter is D.H. Thomas & Co., 54 Wall St., New York.

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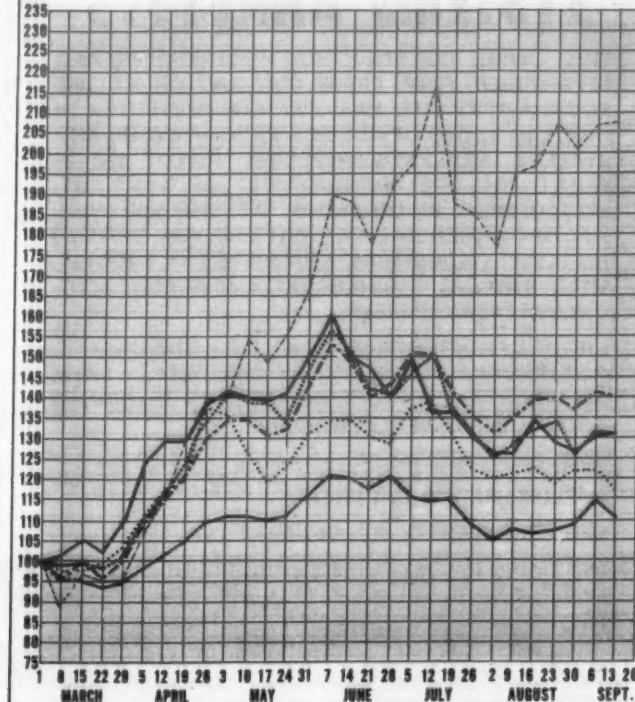
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Computer Stocks Trading Index

— Computer Systems — Software & EDP Services
 — Peripherals & Subsystems — Leasing Companies
 — Supplies & Accessories — CW Composite Index



Composite Down As Market Eases

The *Computerworld* Composite Stock Index dropped one point to 140 for the week ended Sept. 13 as the stock market generally declined.

Of the major stock market indexes, only the American Stock Exchange price index showed a gain, closing up 28 cents (0.94%) to \$29.65.

The Dow-Jones industrial average closed down 4.04 points (0.44%) at 917.21, the Standard and Poor's industrial average was down 0.38 points (0.34%) to 109.98, the New York Stock Exchange composite average closed off 0.13 points (0.23%) at 56.50, and the N.Q.B. over-the-counter industrial average was down 0.35 points (0.085%) to 411.34.

In spite of the declining market, volume for the week on the NYSE was 51,045,030 shares, up 6,182,119 shares, while volume on the AMSE was 25,400,015 shares, up 2,633,990 shares.

Raytheon Among Most Active

Of the *Computerworld* listed stocks, only Raytheon — 15th, down 3 points (6.97%) to 40-1/4 on 265,000 shares traded — was among the NYSE's 20 most active stocks.

However, three *Computerworld* listed stocks reached new highs: Burroughs was up 12 points (5.59%) to 226-3/8, Data-lation Services was up 6 points (22.22%) to 33, and Computer Exchange was up 2 points (10.53%) to 21. One dropped to a new low: Datronic Rental was off 3/8 (4.17%) to 8-5/8.

Among the *Computerworld* listed stocks, 39 issues closed up, 49 closed down, and seven remained unchanged. The previous week, 57 issues were up, 30 down, and seven unchanged.

Overall on the NYSE, 803 issues advanced, 729 declined, and 142

remained unchanged, versus the previous week's score of 1062 advances, 462 declines, and 140 unchanged. One hundred seventy-six issues reached new highs and 29 were at new lows, compared with 134 new highs and 29 new lows the previous week.

CW Indexes Mixed

The five *Computerworld* sector indexes showed mixed activity with two up one point each, one unchanged, and two off.

The Computer Systems index continued an upward trend, closing at 131, up 1 point (0.76%). The Software & EDP Services index also closed up 1 point (0.48%) to 208.

Closing unchanged at 131 was the Peripherals & Subsystems index.

Finishing down were the Supplies & Accessories index, off 2 points (1.8%) to 112, and the Leasing index, off 4 points (3.3%) to 118.

Trading Commentary

The Dow-Jones industrial average rose to a 1968 high of 924.98 on Sept. 9, but then dropped during the week. While some viewed the drop as a normal breather, others felt that it indicated a possible further decline, pointing to the highs of May 7 and July 15 that were followed by big declines.

Backing up contentions that the rally is unstable is the fact that other market indicators have not followed or confirmed the Dow-Jones average. Furthermore, the number of stocks moving to new highs in the week preceding the high was only 134, while the week before an advance in June, the number was 528.

If weakness carries the Dow-Jones average below the 900 mark, it will be the 10th time since mid-April.

COMPUTER STOCKS: TRADING SUMMARY

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	227-187	226 3/8	Burroughs	+ 12	+ 5.88	+ 38.51
NYSE	67 3/4	110-64	61 1/8	Collins Radio	- 6	- 8.84	- 9.75
NYSE	181 1/2	174-66	136	Control Data	+ 3/4	+ 0.85	+ 33.00
AMSE	162	160-86	125	Digital Equipment	—	—	+ 22.65
NYSE	87 1/4	106-81	86 1/4	General Electric	+ 1 1/8	+ 1.32	- 1.15
NYSE	60	91-58	70 1/4	Hewlett-Packard	- 3/4	- 0.96	+ 32.08
NYSE	93 1/8	144-89	122	Honeywell	+ 1/4	+ 0.20	+ 31.01
OTC	296 1/2	376-280	337 1/2	IBM	- 3	- 0.88	+ 16.98
NYSE	103 7/8	153-90	133 3/4	National Cash Register	+ 4 3/4	+ 3.68	+ 28.76
OTC	46 7/8	55-44	46 5/8	RCA	+ 1 1/8	+ 2.37	+ 3.73
NYSE	59 1/8	83-34	60 1/4	Raytheon	- 3	- 6.84	+ 2.87
OTC	22 1/2	66-29	41	Scientific Controls Corp.	- 1	- 2.38	+ 82.22
NYSE	78 3/4	114-72	89 5/8	Scientific Data	- 7/8	- 0.97	+ 13.51
NYSE	48	63-42	48 3/8	Sperry Rand	- 1/2	- 1.10	+ 3.98
AMSE	22 1/2	36-20	31 1/4	Systems Engineering Lab.	+ 1 3/4	+ 5.89	+ 38.98

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	68 3/8	61-52	65 1/2	Addressograph-Multigraph	- 1 1/2	- 1.74	+ 66.46
OTC	21	85-45	60	Alphanumeric	+ 8	+ 16.38	+ 108.71
NYSE	29	37-26	33 5/8	Amplex	- 1/4	- 1.60	+ 16.94
OTC	17 1/4	27-15	20 1/4	Bolt, Beranek & Newman, Inc.	+ 4	+ 24.81	+ 17.39
NYSE	13 1/2	20-12	17 1/4	Bunker-Ramo	- 1/8	- 0.77	+ 27.74
AMSE	32 1/8	50-27	38 1/2	Calcomp	- 1/2	- 1.29	+ 19.84
OTC	24 1/2	48-20	42	Contronics	—	—	+ 71.43
OTC	12	17-10	15 1/2	Computer Equipment	+ 1 1/4	+ 8.77	+ 29.17
OTC	15 1/4	23-13	17 1/4	Data Products	- 1/8	- 0.74	+ 13.11
OTC	19 1/4	27-16	20	Digitronics	- 1 1/2	- 6.99	+ 3.89
OTC	36	57-32	46 3/4	Electronic Memories	+ 2	+ 5.15	+ 4.48
OTC	16	20-9	18	Fabri-Tel	+ 2 3/4	+ 26.75	+ 86.00
OTC	34	71-26	59 1/2	Geller Scientific	+ 2 1/2	+ 4.38	+ 74.99
OTC	12 1/2	26-16	20 1/2	Information Displays	- 1	- 4.88	+ 63.88
AMSE	16 7/8	62-46	36 3/8	Milgo Electronics	- 1 7/8	- 4.91	+ 115.54
AMSE	57 1/2	108-54	85 1/2	Mohawk Data Sciences	- 1	- 1.16	+ 48.00
OTC	74	136-71	101	Optical Scanning Corp.	- 8	- 7.34	+ 36.44
OTC	18	42-16	30 3/4	Photon	- 3/4	- 2.39	+ 70.83
OTC	25 1/8	38-20	26 7/8	Potter Instrument	+ 3/8	+ 1.41	+ 4.87
OTC	40 1/4	98-38	86	Recognition Equipment Corp.	- 2	- 2.28	+ 113.86
OTC	18	25-14	24 3/8	Rivcon Electronics	+ 1 5/8	+ 7.14	+ 82.04
NYSE	48 1/8	66-42	50 1/8	Sanders	+ 2	+ 4.15	+ 8.67
OTC	47	185-63	65	Scan-Data	- 10	- 13.34	+ 36.38
OTC	40 1/2	51-36	43	Tally Corp.	- 3	- 6.52	+ 6.17
NYSE	342 1/4	321-229	260 1/2	Xerox	+ 6 3/4	+ 2.03	+ 18.89

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	46 1/2	64-37	43	Annie Visible	- 1/2	- 1.16	- 11.39
NYSE	20 1/2	32-19	19 1/4	Adams-Mills	- 1/4	- 1.28	- 6.30
OTC	13 5/8	21-13	20 1/4	Baltimore Business Forms	- 2 1/4	- 10.00	+ 40.80
OTC	27	44-21	30 7/8	Barry Wright	+ 8/8	+ 2.08	+ 14.31
OTC	31 1/4	48-26	38 1/4	Data Documents	+ 1/4	+ 0.69	+ 18.00</td

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Credit System Replaces Cash Register

(Continued from Page 1) world that the system can handle 100 terminals. Storage, on disks, ranges from 7 million to 100 million bits, depending on the amount of credit checking desired.

The company said terminals cost \$4000 each and that the computer sells for \$50,000 to \$70,000, depending on the amount of core storage.

Prepares Sales Slip

In operation, the sales clerk places each merchandise tag from purchased articles into the reader. Prices are retrieved from the central data bank, displayed along

with the stock number, and a sales ticket is printed showing each stock number and price. The sales transaction, including any taxes, is automatically totaled, and the sales clerk inserts the customer's charge or credit card.

This action checks the customer's current credit standing, and determines whether the card is listed as stolen or is counterfeit.

If the account is delinquent or the credit limit is being exceeded by the current purchase or if indications are that the "customer" is using either a stolen or counterfeit card, the reader automatically retains the card. Simultaneously a message printer

in the credit manager's office prints out the station number, the customer's account number, and a code indicating the nature of the credit problem.

With this information, the credit manager can then obtain the customer file and review it before phoning or personally appearing at the sales counter, or in the case of a counterfeit or stolen card, call for a member of the store security staff or other appropriate legal authority.

For cash purchases, when a charge or credit card is not used, the transaction is completed with only sales and inventory data recorded.

If an item does not carry a merchandise tag, the clerk keys the stock number or price into the system by use of the terminal keyboard. The system makes the credit check and processes sales and inventory data.

Inventory Updated

During the sales transaction, credit and inventory data are automatically captured and processed to provide accounts receivable data by customer and inventory data by item, by clerk, and by store.

Joseph A. Ricca, president of Ricca Data Systems, Inc., pointed out various other benefits of the

new retail credit system. For example, the fact that each and every purchase is verified and customer credit is checked immediately, in real-time, eliminates the need for floor limits. A person attempting to make several purchases in different departments would be stopped during the purchase at which the credit limit was being exceeded.

Counterfeit or stolen cards, of course, are captured during the initial purchase, effectively halting their further use.

Ricca said the system has already been demonstrated to a number of large retail stores.

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Employment Project Visited by Nixon

CHAPEL HILL, N.C. — Republican presidential candidate Richard M. Nixon, kicking off a campaign swing through the south, stopped here Sept. 11 to study a computer based project being used to match the unemployed with available jobs.

The visit confirmed his interest in this use of computers, the only reference to computer technology so far written into his campaign [CW, Aug. 7].

"I think if a computer can match boys and girls for dates, it can match men and jobs," Nixon said.

Similar systems in New York

and California are in various stages of operation.

Antipoverty Project

The six month experiment, financed by the N.C. Manpower Development Corp., a nonprofit antipoverty agency, is part of an effort to devise a high speed system of pinpointing potential workers across the state and matching them with available jobs.

Edwin M. Danziger, director of administrative data processing at the University of North Carolina at Chapel Hill, is acting as consultant for the computer work,

along with Leonard Stroebel, manager of systems, software, and scientific programming at the university.

A. Wright Elliott, vice president of the Urban Affairs Division of the Manufacturers Association, who helped show Nixon around, explained that the process was not merely to match jobs, but rather an attempt to redefine jobs and re-examine the qualifications and needs of the unemployed.

Program Said "Unique"

Danziger told *Computerworld* afterwards that the program is unique because of its ability to utilize the information gathered by outside workers, and to find and match many practically unlocatable people. After helping them move, the project helps them get oriented to new situations and keep them on the job.

He stressed that this was much more than simply matching up columns on a card. The system is designed to tell why some people could not be matched with jobs, Elliott said.

The MDC believes that the experiment has been worthwhile



Republican presidential candidate Richard M. Nixon confers with Edwin M. Danziger, director of administrative data processing at the University of North Carolina at Chapel Hill, during Nixon's inspection of a computerized project that matches people with jobs.

and that it has learned some valuable lessons. Among them were that refined personal profile and manpower request forms improved the system and that the system had to be kept up to date.

Software Snarled, Airline System Crashed in Flames

(Continued from Page 1)

formed by merging the Bonanza, Pacific, and West Coast airlines last spring), there was a failure of some sort which resulted in planes being late, and an almost complete lack of information being available — all of which was blamed on "the computer" by airline employees who themselves were in the dark.

The inside story was that the communication systems used previously by the three airlines had been disconnected as they were incompatible, and as it would have involved a number of elaborate changes to tie them together. They were replaced by a single system based on an IBM 360.

Backup hardware facilities were available for the new system — but could not be used because of the software failure.

3% of Programs Involved

The programs, amounting to 21,000 instructions, to use the equipment were obtained from IBM, and were the same as those used successfully by two other airlines (Allegheny and Mohawk). These were modified by Air West programmers to fit the Air West configuration. The modifications were apparently minor, only involving 500 lines of coding — or about 3% of the programs. The major reason for the modifications, according to John Jacobs, Air West's director of management information services, was to permit use of two disk drives instead of one and four reservation centers instead of one. There were no backup programs.

No Time to Explain

During a test preceding the switch over, everything went well. Then, shortly after the change was made, everything crashed. Airline personnel were left in ignorance not only of such

things as arrival and departure times, passenger loads, destinations, interline reservations, and cargo loads — which the new system was supposed to provide — but also of what was happening in the computer room. "We did not have time even to explain it to our own people," said Air West Vice President Larry West.

Expected "Up" Momentarily

Not that explanations or forecasts of when the system would come back on the air would have been very accurate anyway. At the time it was thought that the new system was about to return to life momentarily. Indeed, on the third day, it was actually working, but then it went down again throughout the fourth and for part of the fifth.

As a result, no serious attempt was made to reimplement the old communication systems.

Epilogue

With the 24 hour days put in by the IBM team who flew from the East, the system did come to life again July 3 but soon dropped off, and it took another two days before it was working again. Reliable operation was only achieved after three weeks — and by then the outside world was really sitting up and taking notice. Columnists were using the incidents to lash at the airline, customers were angry, and management was facing a take-over bid from Howard Hughes, which apparently started right in the middle of the trouble.

Now many of these troubles are vanishing. The system is up and running, the telephones are being answered, and customers are being smoothed down. Air travel on the line is higher than on the combined services a year ago with the possible exception of the take-over bid which came in the Air West board next month. The matters are smoothed over.

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